Electric Transportation

Lang Reynolds – Manager of Electric Transportation

DUKE ENERGY®

Electric Transportation = Economic Development

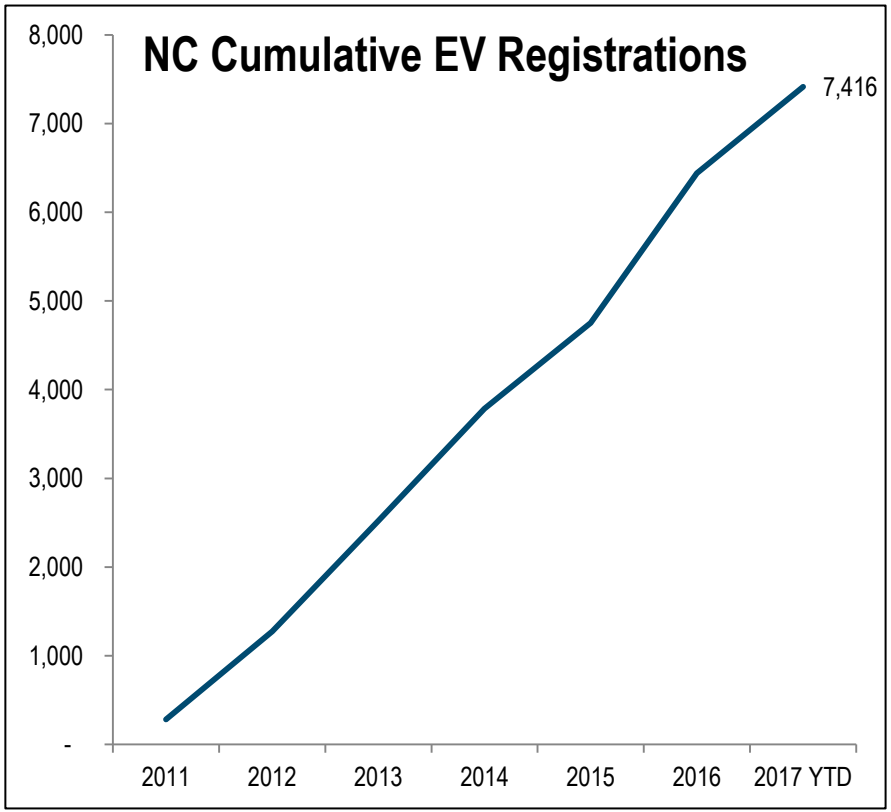
- Fuel and maintenance cost savings.
- Improved air quality facilitates continued industrial recruitment.
- Automakers are expanding electric drive manufacturing and supply chain.
- Downward rate pressure preserves attractive electricity costs.

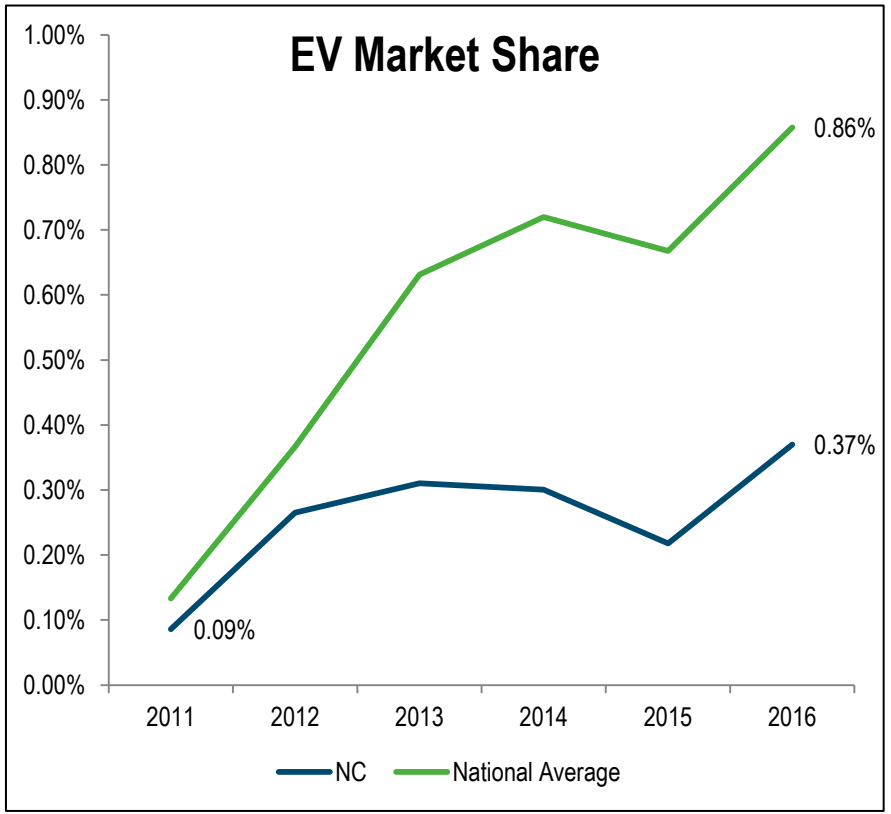
Electric Transportation Market – Not Just EVs

- Road

- Non-Road

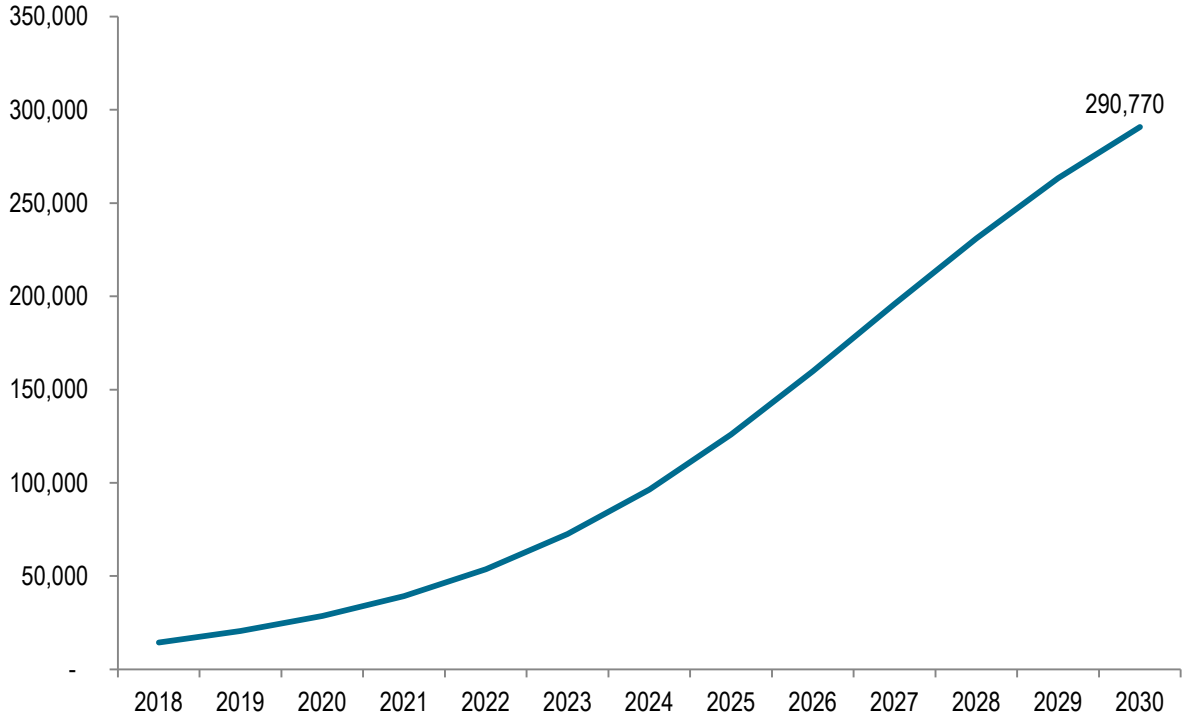
North Carolina – EV Sales Trends





Future Growth and Grid Impacts

Current Forecast: Cumulative DEC+DEP EV Registrations



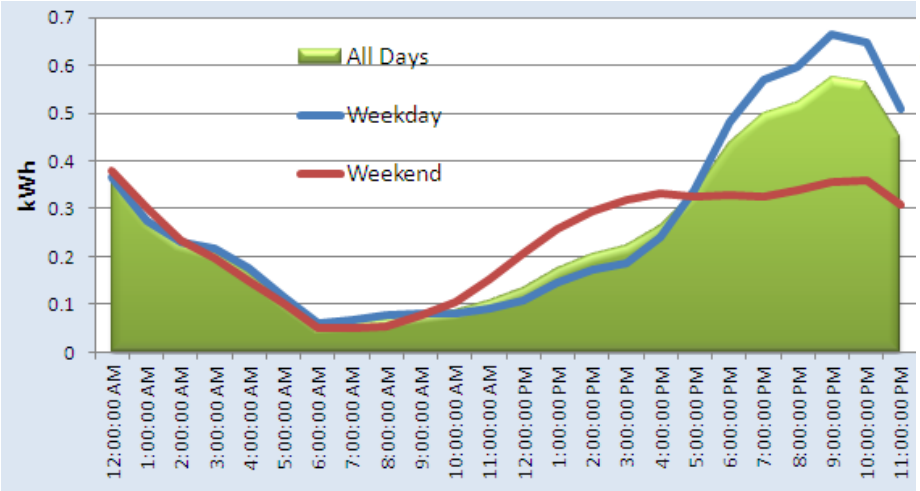
Current Forecast: 2030 Peak Load Impact (Unmanaged)

Summer	(HE17)	DEC 79 MW
		DEP 44 MW
Winter	(HE08)	DEC 11 MW
		DEP 6 MW

Grid Impacts of Electric Transportation

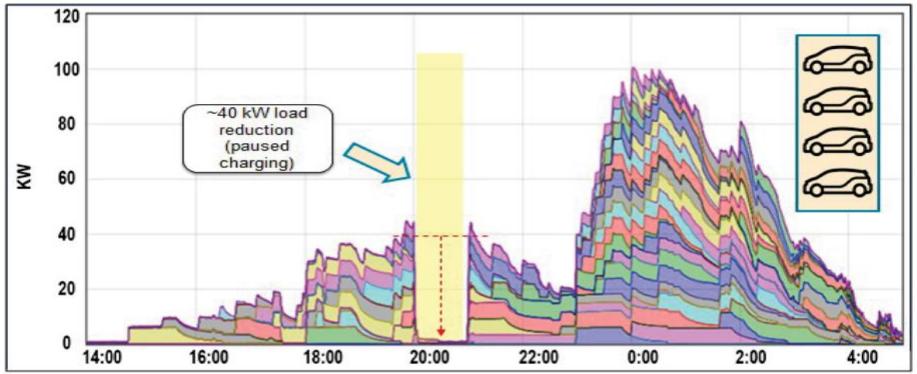
- Managed charging loads are key to maximize grid benefits of EV charging.

Unmanaged



Source: ChargeCarolinas Data

Managed



Source: Pacific Gas & Electric

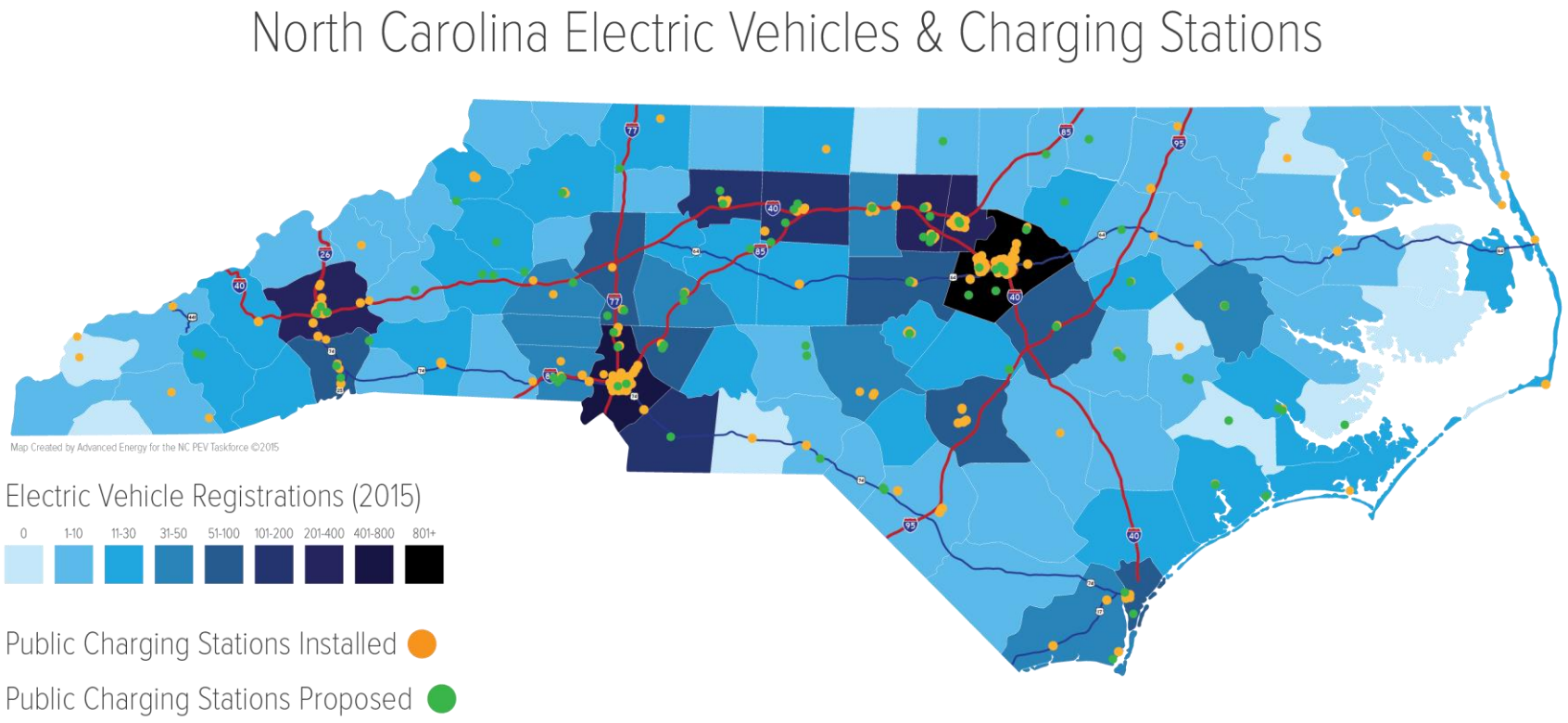
Duke Energy Initiatives Past and Present

- ChargeCarolinas:
  2012-2013 DE installed +100 residential L2 EV charging stations.

- EEI Fleet Electrification Commitment:
  5% of all fleet purchases must be plug-in electric (DE fleet >10,000 vehicles).
  100% of new sedans are now plug-in electric.

- Electric Transportation Infrastructure Grants (NSR Settlement).
  $3.0M total to be distributed 2017-2021
    $1.0M - 200 public L2 EV charging stations.
    $1.5M - Truck Stop Electrification and Electric Transport Refrigeration Unit deployment.
    $0.5M – Electric transit bus charging infrastructure.

NC EV Charging Infrastructure Grants



Future Considerations

- **Electrification of transportation is a global trend.**
- **North Carolina lags other US states in adoption of electric transportation.**
- **No adverse grid impacts have been experienced from EV adoption; none are expected in the near future.**
- **Current regulations do not permit encouraging adoption.**

Appendix

Automaker OEM Electrification Announcements

OEM	Year	Mild Hybrid	Regular Hybrid	EV (PHEV/BEV)	Total Models	Quote
Volvo	2019	X	X	X		"All cars from 2019 will have an electrified option."
Jaguar / Land Rover	2020	X	X	X		"Every vehicle from 2020 will have an electrified version."
Lincoln	2022	X	X	X		"Electrified versions of its models."
Ford	2023	X	X	X	18	"18 electrified models in five years (Ford Corp)."
BMW	2025	X	X	12	25	"25 electrified vehicles by 2025"
Mercedes	2025	X	X	10		Up to 25% of production by 2025."
Aston-Martin	2025			X		"Electrify all production cars in 2025."
Hyundai	2025	X	X	X		"10% of sales will be electrified by 2025."
Audi	2025	X	X	X		"30% of sales will be electrified by 2025."
VW Group	2025			X	~~30~~ **80**	"Launch ~~30~~ **80** electric cars globally among VW's brands by 2025. Investing ~~$10B~~**$24B**.'
Uber	2020		X	X		"All-electric or hybrid in London by 2020."
Uber	2025			X		"All-electric or plug-in hybrid in London by 2025."

Source: EPRI

Aggressive Global Commitment to Transportation Pollution

Country	Year of Proposed Ban
Norway	2025
Netherlands	2030
Germany	2030
Scotland	2032
UK	2040
France	2040
India	2030

City	Year of Proposed Ban
Stuttgart	2018*
Munich	TBD
Oslo	TBD
London	2025
Madrid	2025
Paris	2025
Athens	2025
Mexico City	2025

Barriers to Adoption

Awareness	Infrastructure	Cost